

AMENDMENTS TO THE DRAWINGS:

The attached sheet of drawings includes changes to Fig. 7. This sheet, which includes Fig. 7, replaces the original sheet including Fig. 7. In Fig. 7, a typographical error has been corrected by replacing "MUP" with --MOP--.

Attachment: Replacement Sheet
 Annotated Sheet Showing Changes

REMARKS/ARGUMENTS

Applicant thanks the Examiner for the thorough consideration given the present application. Claims 1-19 are pending in the present application. Claims 1, 3, and 5-10 have been amended. Claims 1 and 10 are independent claims. Claims 12-19 are new. The Examiner is respectfully requested to reconsider his rejections in view of the Amendments and the following Remarks.

Claims 1, 5, and 6 have been amended to remove "means-plus-function" language. It is respectfully submitted that such amendments were not made for any reason relating to patentability. Furthermore, it is respectfully submitted that such amendments do not narrow the scope of the claims.

Furthermore, in the above amendments, claims 3, 5, and 7-9 have been changed from multi-dependent claims to singly dependent claims. It is respectfully submitted that each of these claims have been amended to depend upon the broader of the claims from which they depend. Accordingly, it is respectfully submitted that these amendments do not narrow the scope of these claims.

Accordingly, it is respectfully submitted that the above-mentioned claim amendments do not give rise to estoppel; thus,

it is submitted that claims 1, 3, 5, and 6-9 are entitled to their full range of equivalents during future analysis.

Claim for Priority

It is gratefully acknowledged that the Examiner has recognized Applicant's claim for foreign priority. In view of the fact that Applicant's claim for foreign priority has been perfected, no additional action is required from Applicant at this time.

Drawings

Attached herewith is a drawing correction to Fig. 7. Specifically, "MUP" has been replaced with --MOP--. It is respectfully submitted that this drawing correction adds no new matter to the present application. Instead, the drawing correction merely corrects a typographical error, as will be evident upon review of page 6, lines 7-11, of the present specification.

In view of the drawing correction, it is respectfully submitted that the Formal Drawings comply with the requirements of the USPTO. Thus, the Examiner is respectfully requested to indicate that the Formal Drawings have been accepted. Should either the Examiner or the Official Draftsperson have any

objections to the drawings, it is respectfully requested that the undersigned be contacted as soon as possible so that the appropriate action may be taken. Unless such notification is received, no further action is believed to be necessary.

Acknowledgment of Information Disclosure Statement

The Examiner has acknowledged the Information Disclosure Statement filed on October 15, 2003. An initialed copy of the PTO-1449 has been received from the Examiner. No further action is necessary at this time.

Rejection Under 35 U.S.C. § 102

Claims 1-11 stand rejected under 35 USC § 102(b) as being anticipated by U.S. Patent No. 4,387,465 to Becker (hereafter Becker). This rejection is respectfully traversed.

It is respectfully submitted that claims 1-11 are not anticipated by the Becker patent. MPEP § 2131 sets forth the following:

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. Of California*, 814 F2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claims." *Richardson v. Suzuki Motor Co.*, 868 F2d 1226, 1236, 9 USQP2d 1913, 1920 (Fed. Cir. 1989).

It is respectfully submitted that Becker does not set forth each and every element as defined in the claims. Thus, the Examiner's rejection based on 35 USC 102 has been obviated.

Independent claims 1 and 10 recite detecting events at which the level of a received signal crosses a predetermined level, and combining multiple versions of that signal, which are shifted with respect to each other by amounts corresponding to the spacing of the events. Applicant respectfully submits that Becker fails to disclose the combination of such features.

Synopsis of Becker

Becker's invention is directed to communication systems using spread spectrum modulation and demodulation. Becker discloses that a transmitter 8 (Fig. 1) modulates data onto an RF signal. The transmitter then performs additional modulation on the data-modulated RF signal using a sequence of binary pulses, which are generated by a pseudo-random number (PRN) generator 16. Specifically, the PRN modulator 14 applies a 180-degree phase shift to the RF signal when the PRN sequence changes state. According to Becker, the pulse width of each binary pulse in the PRN sequence is referred to as a "chip"

(Ct). After PRN modulation, Becker teaches that the signal is transmitted to the receiver 9.

According to Becker, the PRN generator 26 in the receiver generates the same PRN sequence used by the transmitter. Becker discloses that the receiver first performs RF demodulation on the received signal. Thereafter, the receiver uses the PRN sequence to phase-shift the signal in order to recover the data. However, Becker discloses that the receiver must generate the PRN sequence in synchronization with the sequence generated in the transmitter, in order to correctly obtain the data. See col. 4, lines 13-56.

Thus, Becker describes multiple types of synchronization circuits in the receiver that use the output of the PRN demodulator (referred to as "incoming signal"; col. 6, lines 22-24) to determine whether the PRN sequence in the receiver is synchronized with the PRN sequence in the transmitter. Such circuits include "integrate and dump" circuits and "sequential detector" circuits.

Conventional Integrate and Dump Circuit

In Fig. 4, Becker illustrates a synchronization circuit that applies incoming signal (i.e., the output of the PRN demodulator) to an integrator 30. The output signal of the

integrator 30 is sent to a comparator 32, which constantly compares the signal to a threshold voltage (from threshold voltage source 34). Becker discloses that the comparator indicates that the receiver's PRN sequence is synchronized to the PRN sequence in the transmitter when the integrator's output signal exceeds the threshold voltage. If the integrator output does not exceed the threshold, Becker teaches shifting the PRN sequence by $\frac{1}{2}$ of a chip (i.e., $\frac{1}{2} Ct$), and then applying the new output of the PRN demodulator to the integrate and dump circuit to see if the PRN sequences of the receiver and transmitter are synchronized. See col. 6, lines 18-56.

Conventional Sequential Detection Circuit

In the sequential detection circuit of Fig. 6, Becker discloses that the output of the PRN demodulator ("incoming signal") is applied to a summing amplifier 40, which subtracts a bias signal from the incoming signal. According to Becker, this bias signal is proportional to the average value of the incoming signal during an instance when it is known that the receiver's PRN sequence is not synchronized with the transmitter's PRN sequence. Becker teaches that the difference signal from the summing amplifier is sent to an integrator 48. The integrator's output is sent to a comparator 50, which determines whether the

integrated signal dips below a negative threshold. According to Becker, if the output of the integrator does not fall below the negative threshold during a preselected time period, the circuit detects synchronization between the PRN sequences of the receiver and transmitter. Otherwise, the PRN sequence of the receiver is shifted by $\frac{1}{2} Ct$, and the detection process is repeated. See col. 7, line 38 - col. 8, line 65.

Sequential Detection Circuit of Becker's Invention

Becker's invention in Figs. 8 and 9 illustrates a sequential detection circuit that uses similar principles of operation as conventional sequential detectors. For instance, when this circuit detects that the PRN sequence falls below a negative threshold, it also shifts the PRN sequence by $\frac{1}{2} Ct$. See, e.g., col. 11, lines 40-46 and 59-67.

However, Becker's invention purports to improve upon the conventional sequential detection circuits by providing a feedback circuit that varies the bias voltage applied to the summing amplifier based on the amount of time it takes for the integrator output to cross below the negative threshold ("dismissal time") for the previous non-synchronized PRN sequence. Specifically, the bias voltage is altered so that the

median dismissal time for the PRN sequences remains substantially constant. See, e.g., col. 11, lines 46-54.

Becker Fails to Teach Claimed Features

In page 2 of the Office Action, the Examiner asserts that Becker discloses a signal input for receiving a signal, citing col. 2, lines 57-60 and col. 5, line 67 - col. 6, line 2. The Examiner further asserts that Becker discloses detecting events at which the signal level crosses a predetermined level with a predetermined slope, citing col. 6, lines 2-39. From these cited passages, it is clear that the Examiner is relying upon the output of Becker's PRN demodulator (i.e., Becker's "incoming signal") as the claimed received signal.

However, in page 2 of the Office Action, the Examiner further asserts that Becker discloses multiple versions of the signal that are shifted with respect to each other by amounts corresponding to the spacing of the events. The Examiner cites col. 7, line 10 - col. 8, line 51; and col. 9, line 39 - col. 10, line 63. In these passages, Becker provides no teaching that versions of the incoming signal are shifted with respect to each other. Instead, the cited passages only disclose shifting the PRN sequence of pulses, which is generated by the PRN generator 26. Thus, Becker fails to disclose multiple versions of the

incoming signal. Accordingly, the Examiner has failed to provide any teaching in Becker of multiple versions of the received signal, as required by independent claims 1 and 10.

Furthermore, Becker only discloses that the PRN sequence is shifted by half-chip ($\frac{1}{2}$ Ct) steps. Becker fails to disclose shifting the PRN sequence by an amount corresponding to the spacing at which the incoming signal crosses a predetermined level. Accordingly, Becker fails to disclose that multiple versions of any type of signal are shifted with respect to each other by amounts corresponding to the spacing of events at which the signal level crosses a predetermined level, as recited in claims 1 and 10.

Applicant respectfully submits that independent claims 1 and 10 are allowable at least for the reasons set forth above. Accordingly, Applicant submits that claims 2-9 and 11 are allowable at least by virtue of their dependency on claims 1 and 10. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

New Claims

Claims 12-19 are newly filed. It is respectfully submitted that the filing of these claims does not add any new matter to the present application. For instance, claims 12-14 and 16-18

are supported in the originally filed specification at page 6, line 14 - page 7, line 26. Claims 15 and 19 are supported in the specification at, e.g., page 8, lines 12 - 31; page 12, line 17 - page 13, line 19; and page 15, line 16 - page 16, line 9.

It is respectfully submitted that independent claims 1 and 10 are allowable at least for the reasons discussed above; accordingly, Applicant submits that claims 12-19 are allowable at least by virtue of their dependency on claims 1 and 10.

Conclusion

Since the remaining patents cited by the Examiner have not been utilized to reject the claims, but to merely show the state of the art, no comment need be made with respect thereto.

In view of the above remarks, it is believed that the claims clearly distinguish over the patents relied on by the Examiner, either alone or in combination. Accordingly, the Examiner is respectfully requested to reconsider the outstanding rejections and issue a Notice of Allowance in the present application.

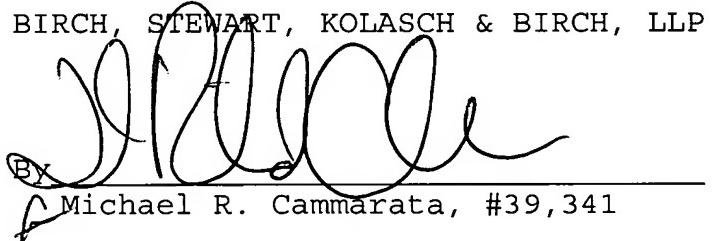
Should the Examiner believe that any outstanding matters remain in the present application, the Examiner is respectfully requested to contact Jason W. Rhodes (Reg. No. 47,305) at the telephone number of the undersigned to discuss the present

application in an effort to expedite prosecution.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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MRC/JWR

Attachments: Replacement Sheet
Annotated Sheet

ANNOTATED SHEET



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FIG. 7

